619-B-177 PAINTING BRIDGE STEEL

(Adopted 04-17-08)

The Standard Specifications are revised as follows:

SECTION 619, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 619 – PAINTING BRIDGE STEEL

619.01 Description

This work shall consist of preparing surfaces and applying paint to steel bridges in accordance with ~~these specifications~~ *105.03* ~~or as directed~~.

MATERIALS

619.02 Materials

Materials shall be in accordance with the following:

Epoxy Intermediate Paint	909.02(b)
Finish Coat for Weathering Steel	909.02(e)
Multi-Component Inorganic Zinc Primer	909.02(a)1
Organic Zinc Primer	909.02(a)2
Polyurethane Finish Coat	909.02(c)
~~Single Component Inorganic Zinc Primer~~	~~909.02(a)2~~
Structural Steel Coating Systems	909.03
Waterborne Finish Paint	909.02(d)

Material safety data sheets shall be provided in the QCP for all materials to be delivered to the project site.

CONSTRUCTION REQUIREMENTS

619.03 Quality Control and Quality Assurance

The Contractor shall be responsible for the quality of work on the contract and shall ensure that all work has been performed by accepted quality control methods. A QCP shall be prepared and submitted by the Contractor in accordance with ITM 803. ~~The QCP shall contain information specific to each bridge in the contract and shall be well organized in content. The QCP shall be submitted at least 15 work days prior to commencing this work.~~ No work may begin until written notice has been received that the QCP was accepted by the Engineer. The ~~QCP~~ *QC* manager shall furnish the current ~~SSPC Structural~~ *referenced* ~~Steel Painting Manual, Volumes 1 and 2,~~ *SSPC Standards* at the project site.

~~The painting Contractor shall be~~ *Cleaning and painting shall be done by a Contractor* certified *as* SSPC-QP ~~1~~*2* for cleaning and painting *existing* bridge steel *on steel bridges constructed before 1995, regardless of whether the existing coating is advertised as non-hazardous based or hazardous based. Cleaning and painting shall be done by a Contractor that at a minimum is certified as SSPC-QP 1 for cleaning and painting new bridge steel or for cleaning and painting existing bridge steel on steel bridges constructed after 1994.* ~~which does not have lead coatings and certified SSPC-QP~~

~~2 for cleaning and painting bridge steel which does have lead based coatings. Evidence of the certifications shall be provided in the QCP. A QCP manager and QC technicians shall also be identified in the QCP.~~

The Department will accept work performed on the project through quality assurance inspections and testing. Acceptance testing will be performed and will be the basis for which acceptance will be made.

(a) Acceptance Testing Definitions

The following definitions of terms shall apply to acceptance testing of painting steel bridge work.

1. Lot

A lot shall be a series of tests performed on each phase for each ~~1076~~ *1000* sq ft (~~100~~ *93* m^2) or portions thereof.

2. Series

A series shall be 10 random tests performed by the Engineer on a lot.

3. Phase

A phase shall be painting operations consisting of either the cleaning of steel or the application of each coat of paint.

(b) Testing Procedure

During acceptance testing, the results of the random testing within a series will be compared to the specified requirements for that phase of work. A series of spot measurements spaced evenly over each lot will be made. The average of *the* 10 spot measurements for each lot shall not be less than the specified thickness. A single spot measurement in any lot shall not be less than 80% of the specified thickness. A reading below the minimum of the average of 10 spot measurements less than the specified thickness shall be considered a defect. If there is only one defect for the series of tests, the lot will be accepted provided there are no visual defects. If two defects are found in the first series of tests, then a second series of tests for each lot shall be measured. If three defects are found in the first series of tests, then the lot fails. If the first and second series of tests have four or less defects, both series pass. If there are more than four defects, then the lot fails.

If a lot fails, corrective action shall be taken to make the lot acceptable. Corrective action shall be submitted in writing and performed as approved. A failed lot shall not be covered until the whole lot has been accepted.

(c) Test Methods and Procedures

The current version of the following test methods and procedures shall be performed as a minimum for quality control by the Contractor. These and other tests may be performed for acceptance testing by the Engineer.

TEST/PROCEDURE	METHOD AND PROCEDURE
Surface Profile	ASTM D 4417
Clean Compressed Air	ASTM D 4285
Cleaning of Steel	SSPC Vis 1, Vis 3~~, and ISO 8501-1~~
Cleanliness of Recycled Ferrous Metallic Abrasives	*SSPC AB 2*
Dry Film Thickness	SSPC PA 2
State of Cure of Inorganic Zinc Primers	ASTM D 4752
Relative Humidity	ASTM E 337

619.04 Prosecution of Work

Prosecution of work shall be in accordance with the applicable requirements of 108.03. Once the ~~operations of~~ cleaning and painting *operations* have begun, it shall be performed on all work days without stoppage until all work has been completed. If the contract contains more than one bridge, a schedule shall be included in the QCP which provides the sequence of work on the bridges. ~~When~~ *Once* work has begun on a bridge, it shall be performed until complete, including all cleanup.

Permission shall be obtained in writing to start or continue work at the hold points as follows:

(a) prior to the acceptance of the QCP and start of work;
(b) immediately following ~~a~~ *each phase of* surface preparation ~~phase~~;
(c) immediately before the application of the first coat;
(d) prior to the application of each succeeding coat; and
(e) after the final coat has cured.

A minimum of one day's notice shall be given in advance of each of the hold points.

619.05 Inspection Access to Bridges

Safe and reasonable access to all points of the bridge shall be provided for the Engineer's inspections immediately upon request. ~~The inspection access equipment shall be obtained, maintained, and kept in safe working order.~~

619.06 Maintaining Traffic

The traffic lanes may be restricted when surface preparation or painting phases are being performed on a portion of the bridge over the traveled roadway, or as directed, when the need exists. ~~A traffic maintenance plan shall be provided in the QCP and shall be in accordance with the plans.~~

Construction signs in accordance with 801.04 shall be furnished and placement at each project site shall be as shown in the QCP. However, a "Bridge Painting Ahead" sign may be used in place of the "Road Construction Ahead" sign.

The traffic maintenance plan shall include a type of barrier system which shall protect against blasting of vehicles or pedestrians, eliminate abrasive materials and debris from falling onto the traveled portion of the pavement, and prevent the spreading of

abrasive materials and debris in the area which may create a traffic hazard. If the intended purpose of the protective devices has not been accomplished, work shall stop until adequate corrections have been made. All abrasive material or debris shall be removed by the end of each day's work in accordance with 619.07.

619.07 Environmental and Safety Requirements

Pollution control and waste disposal of existing paint *residue* and debris shall be in accordance with the following requirements.

~~The QCP shall contain a written description of the Contractor's hazardous waste training program in accordance with 40 CFR 265.16 and ITM 803. Likewise, the waste contingency plan shall be contained in the QCP and in accordance with ITM 803.~~

~~A health and safety plan shall be provided in the QCP and in accordance with ITM 803.~~ Workers shall be protected in accordance with IOSHA requirements. All personnel on the project site shall wear personal protective equipment. The protective equipment shall be furnished by the Contractor, including to Department personnel. Training shall be given to all personnel provided with the protective equipment. Protective equipment shall include, but not be limited to, clean air supplied respirators, air purifying respirators, conventional hood as applicable, eye protection, and protective clothing. Two rooms for changing and washing shall be provided on ~~lead primed~~ bridges *containing hazardous-based coatings*.

(a) Pollution Control

~~The containment procedure plan shall be provided in the QCP. The telephone numbers for the IDEM Emergency Response Branch, local health department, and all water intake users within 500 ft (150 m) shall be provided in the QCP.~~

Blasting materials, scrapings, wire brushings, and paint particles shall be contained in accordance with SSPC-Guide 6 ~~(CON)~~, Class ~~3~~*2A with method A, level 2 emissions*, specifically for ~~zinc~~ *non-hazardous* primed bridges, and SSPC-Guide 6 ~~(CON)~~, Class 2*A or better with method A, level 0 emissions*, for ~~lead~~ *hazardous* primed bridges.

If a spill, as defined in IDEM Regulation 327 IAC 2-6.*1* does occur, all work shall stop and immediate action shall be taken to clean up the site. Spills of materials, which enter or threaten to enter the water, shall be handled in accordance with IDEM Regulation 327 IAC 2-6.*1*. The IDEM Emergency Response Branch, the local health department, and all water intake users within 500 ft (150 m) of the bridge shall be immediately contacted and advised of the spill. Written documentation of all such contacts and actions shall be kept. All applicable Federal, State, and local rules and regulations described in 619.07(b)1 shall be observed.

On *existing* bridges with ~~lead paint,~~ *hazardous-based coatings, either* steel grit blasting abrasives *in accordance with SSPC AB 1* shall be used and recycled. ~~The~~ *or mineral/slag blasting abrasives in accordance with SSPC AB 3 shall be used and the waste residue generated shall be treated at a facility rendering it to a non-hazardous state and disposed of in accordance with all applicable Federal, State, and local*

regulations. If steel grit blasting abrasives are used, the recycling equipment shall be capable of separating the blasting abrasive from the paint debris.

Each bridge shall generate a separate waste stream and shall not be commingled with other materials. The *first sample of waste* residue from the bridge shall be sampled ~~within~~ *after* the first ~~five days~~ *day* of removal and shipped to be tested *within 24 hours in a manner agreed to by the Department and as described in the QCP. The Engineer will witness the extraction of each waste residue sample. The Department will maintain custody of each waste residue sample until it is shipped. A duplicate of each waste residue sample will be retained by the Department. Each waste residue sample shall be taken by random method as described in the QCP which reflects representation of the entire bridge. Each waste residue sample shall represent approximately 25% of the cleaning area. All samples shall be analyzed for full Toxicity Characteristic Leaching Procedure (TCLP).* Residue shall be placed in an approved container. Such containers shall be ~~properly~~ labeled and maintained to comply with 40 CFR 264.

No waste shall remain on the booms or on ~~the~~ *any* water surface overnight. All blasting debris shall be cleaned up after each day's work. All waste material shall be properly stored at the project site to prevent loss or pollution.

If hazardous materials are found in the first or subsequent waste residue sample of an advertised, non-hazardous site, the Contractor shall immediately stop all cleaning and painting operations on that bridge. The Contractor shall notify the Engineer that hazardous materials have been found and, if not addressed in the QCP, the Contractor shall submit revisions to the QCP that detail the necessary changes due to the presence of hazardous materials. The Contractor shall not return to work until the revised QCP is approved in writing.

(b) Waste Disposal

Disposal of existing paint *residue* and debris shall be in accordance with SSPC-Guide 7 ~~(DIS)~~ and the following requirements.

1. Laws to be Observed

Federal and State laws and regulations regulate the disposal of bridge painting debris. Bridge paint debris shall be manifested or certified and shall be disposed of at an appropriate disposal facility.

The Contractor shall have direct knowledge regarding compliance with laws pertaining to pollution control and waste management such as follows.

a. subtitle C of the Resource Conservation and Recovery Act, 40 CFR 261, 262, 263, 265, and 268;

b. the Solid Waste Rule, 329 IAC ~~2~~ *10*;

c. the Hazardous Waste Rule, 329 IAC 3.*1*;

d. the Air Pollution Rule ~~326~~ *329* IAC *6*-4;

e. the Water Pollution Rule, 327 IAC 2-6.*1*;

f. the United States Department of Transportation regulations 49 CFR 172.300; and

g. OSHA worker safety regulations 29 CFR 1926.

2. Time Limitations

The maximum time limit from the date the generated waste is placed in a container and the date the material is transported to a permitted treatment, storage, and disposal facility shall be 90 calendar days.

3. Marking of Spent Material Containers

Spent material containers shall be marked with the date that waste *residue* is first placed in the container. Until laboratory results are received concerning the category of the waste *residue,* the containers shall be labeled "LEAD PAINT WASTE DEBRIS" or "ZINC PAINT WASTE DEBRIS", as appropriate. *The labeling shall include the contract number, bridge number, sample number, and sample date.* Labeling of containers as hazardous waste will not be required until the appropriate laboratory analysis determines the waste *residue* to be hazardous in accordance with the current *Resource Conservancy Recovery Act* (RCRA) hazardous waste definitions. Immediately upon notice that the waste *residue* is hazardous, the containers shall be marked in accordance with 49 CFR 172, Subpart D.

4. Instruction for Disposal of Paint Waste *Residue*

Sampling and analysis of the paint waste ~~debris~~ *residue* shall be performed to determine if the wastes are hazardous. If the waste *residue* is not found to be hazardous in accordance with current RCRA hazardous waste definitions, the waste *residue* material shall be disposed of at an appropriate disposal facility. If the waste *residue* is found to be hazardous, IDEM ~~shall~~ *will* be notified and an EPA identification number will be obtained ~~by the Department~~. This *number* will be provided to the Contractor within 30 days of the start of waste generation for bridges having hazardous waste paint debris. The waste *residue* from different bridges shall not be mixed. The Contractor shall have the *following* responsibilities ~~as follows~~:

a. determining the location for disposal, treatment, or recycling of the waste *residue*, obtaining the Engineer's approval of the site, and arranging with the approved site for acceptance of the materials;

b. preparing a hazardous waste manifest, as required by Federal and State requirements, for signature;

c. scheduling the shipment of waste *residue* to the permitted disposal site;

d. ensuring that the hazardous waste manifest is carried in the transportation vehicle;

e. ensuring that all required hazardous materials placards are properly displayed on the vehicle;

f. ensuring prompt movement of the vehicle to the disposal site; and

g. returning one copy of signed manifest documents to the Engineer. A copy of the chemical and physical analysis of the waste, all deposit receipts, manifests, and required paperwork for disposal shall be given to the Engineer and all waste *residues* disposed of before the contract will be accepted.

~~The waste disposal site shall be identified in the QCP.~~

5. Instructions for Disposal of Other Project Generated Waste

The other wastes that may be generated on the project include, but are not limited to, spent solvents from cleaning of equipment and empty or partially empty containers of paint, paint thinners, spent abrasives, and solvents. The Contractor shall recycle or dispose of all project-generated waste materials.

If the waste is defined as a hazardous waste in accordance with the current RCRA definitions, the waste shall be recycled or disposed of in accordance with 619.07(b)4. All project generated waste and the method of recycling or disposal shall be identified in the QCP.

619.08 Surface Preparation

Cleaning of steel surfaces shall be performed by ~~a~~ *an* SSPC certified contractor. This requirement will not apply to the following:

(a) shop cleaning~~,~~*;*

(b) bearings at end bents~~,~~*;*

(c) small sections of beams at end bents or at piers with open joints~~,~~*;* or

(d) small sections of beams or other structural members where heat-straightening or similar repairs have taken place.

Surfaces to be painted shall be cleaned in accordance with *the* SSPC classification, unless otherwise specified. ~~The latest cleaning comparison chart available shall be provided in the QCP.~~ Compressed air shall pass through an oil and water extractor before entering another apparatus.

Field cleaned steel surfaces shall be primed the same day as cleaned. If rust forms after cleaning, the surface shall be cleaned again before painting. Work shall be stopped when there is disagreement about whether a surface has been adequately cleaned. Written notification shall be provided specifically identifying the problem.

Cleaning shall be scheduled so that dust or other contaminates do not fall on wet, newly painted surfaces.

A dust collector suitable for the containment type and size shall be used during all blast cleaning operations in preparation for all structural steel paint systems and as directed for a partial paint system.

The surface profile of cleaned new steel surfaces shall not be less than 1 mil (25 µm) and not greater than 2 mil (50 µm). The surface profile of cleaned existing steel shall not be less than 1 mil (25 µm) and not greater than 3 mil (75 µm).

Pressure washing in accordance with 619.08(a) and solvent cleaning in accordance with 619.08(b) shall be performed *to remove all oils and soluble salts* before all other cleaning methods *are started. The Contractor may propose alternate cleaning methods in the QCP that will accomplish the removal of all oils and soluble salts.*

(a) Pressure Washing

All surfaces to be painted and the tops of pier and abutment caps shall be washed. The washing shall be accomplished by means of a low pressure power water washer with potable water. The pressure shall be between 800 and 1500 psi (5 and 10 MPa). If detergents or other additives are added to the water, the surface shall be rinsed with potable water before the detergents dries. All washed surfaces shall be completely free of all ~~foreign matter~~ *oils and soluble salts* and shall be approved prior to other surface preparation activities.

(b) Solvent Cleaning

After pressure washing has been approved, solvent cleaning shall be in accordance with SSPC-SP1.

(c) Near-White Blast Cleaning

Near-white blast cleaning shall be in accordance with SSPC-SP10/NACE No. 2.

(d) Commercial Blast Cleaning

Commercial blast cleaning shall be in accordance with SSPC-SP6/NACE No. 3.

(e) Hand Tool Cleaning

Hand tool cleaning shall be in accordance with SSPC-SP2.

(f) Brush-Off Blast Cleaning

Brush-off blast cleaning shall be in accordance with SSPC-SP7/NACE No. 4.

(g) Power Tool Cleaning

Power tool cleaning shall be in accordance with SSPC-SP3.

(h) Power Tool Cleaning to Bare Metal

Power tool cleaning to bare metal shall be in accordance with SSPC-SP11.

All mill scale shall be removed, except for that mill scale which remains in the lower portion of deep pits. The Engineer will determine the amount of mill scale that is to remain.

619.09 Paint Systems

Paint systems shall be applied in accordance with the manufacturer's recommendations. The dry film thickness of a paint coating will be measured with a calibrated film thickness gauge *in accordance with SSPC PA 2. All paint coatings shall have a dry film thickness not less than 80% of the required dry film thickness.*

(a) Structural Steel Paint System

The coating system shall consist of an inorganic zinc primer with a dry film thickness of 3 mil (75µm), an epoxy intermediate coat with a dry film thickness of 4 mil (100 µm), and a polyurethane finish coat with a dry film thickness of 3 mil (75 µm) for the painting of steel bridges and other structural steel.

(b) Partial Paint System

The coating system shall consist of organic zinc primer with a dry film thickness of 3 mil (75 µm) and a waterborne finish coat with a dry film thickness of 3 mil (75 µm) for partial painting of steel bridges and other structural steel.

619.10 Painting

Painting shall be performed by a SSPC certified contractor, except as noted in 619.08. ~~All technical data sheets containing the manufacturer's recommendations and instructions shall be provided in the QCP and in accordance with ITM 803.~~

Concrete at all junction points of concrete and steel shall be adequately shielded or otherwise protected so the application of paint on steel is full and complete, and that spraying onto the concrete is minimized.

If a blasted or painted surface is unsatisfactory, removal of the paint, thorough cleaning of the surface, and repainting or other correction will be required as directed. Where defects or damages occur in a film of any coating, all defective areas shall be removed to soundly bonded paint or bare steel and painted to the specified thickness.

No lettering shall be painted on bare or painted steel surfaces, except marks required for erection and project information stenciled in accordance with 619.10(g).

Joints of all lapping members shall be caulked after either the application of the epoxy intermediate coat of the structural steel paint system or the application of the organic zinc primer of the partial paint system. The intermediate or primer coat shall be cured to the manufacturer's recommended coating cure time prior to caulking. The caulk used shall be compatible with either the structural steel paint system or the partial paint system, and in accordance with the paint manufacturer's recommendations as described in the QCP.

1. *All vertical and diagonal lapping members shall be caulked along the top and sides. The bottom shall remain open for drainage.*

2. *All horizontal lapping members shall be caulked along the leading edge and sides of steel members facing toward oncoming traffic or facing toward the prevailing wind direction.*

3. *All horizontal members shall remain uncaulked along the side of steel members facing away from oncoming traffic or prevailing wind direction.*

(a) Weather Limitations

Field painting will not be permitted between November 15 and the following April 1 *unless requested in the QCP and approved in writing*. Painting shall begin only when the 24 h ambient temperature is to remain above 50°F (10°C) after paint application, and the steel surface temperature is between 50 and 100°F (10 and 40°C). Coating and curing shall be done only when the relative humidity is to remain between 30 and 80%. ~~All variations of these weather limitations to allow the use of any coating below the minimum or above the maximum temperature or humidity as may be recommended by the manufacturer shall be provided in the QCP.~~ The pot life and induction time shall be in accordance with the manufacturer's recommendations for the existing temperature and humidity.

Paint shall not be applied when the air is misty, or when conditions are otherwise unsuitable. The surface temperature of the steel to be painted shall not be within 5°F (3°C) of the dew point. When painting in a protected area to eliminate the above conditions, the steel shall remain under cover until the paint is dry. All wet paint which has been exposed to excessive humidity, rain, snow, or condensation shall be permitted to dry. Damaged paint shall then be removed. The surface shall be re-cleaned and repainted as directed. The Engineer will be the sole authority to decide when work may begin or shall stop due to weather conditions.

(b) Storage

Paint shall be stored in accordance with the manufacturer's recommendations. If paint is permitted to remain in storage, the containers shall be turned end for end at least once per week. The paint shall be used within the manufacturer's recommended shelf life.

(c) Mixing

Paint shall be thoroughly mixed so that the pigment is completely in suspension and the consistency is uniform. Mechanical mixers shall be used in accordance with the manufacturer's instructions. The paint shall remain in this condition during application to the steel surface. After initial mixing and before application, zinc primer shall be strained through a metal screen not coarser than the No. 30 (600 µm) sieve.

Partially empty containers of paint shall not be used. Partial mixing of containers will not be permitted. All paint containers shall remain closed until needed for mixing.

(d) Thinning

When required for proper application, the thinning of field paint will be permitted. Only thinners recommended by the manufacturer and as approved shall be used. Thinners shall be added to paint in accordance with the manufacturer's recommendations. The maximum quantity added shall not exceed the manufacturer's recommendations. The thinned paint shall not exceed IDEM regulations for volatile organic compounds.

The Contractor shall contact IDEM and the local air pollution control board for information about any volatile organic compound regulations or restrictions. ~~Proof of contact to these agencies shall be provided in the QCP.~~

(e) Application of Paint

All paint coatings shall be of colors to produce a distinct contrast with adjacent coatings, including the color of a clean steel surface.

Paint shall be applied by either an airless or conventional spray method which has been recommended by the paint manufacturer. The compressed air used for painting shall pass through an oil and water extractor before entering the paint pot. However, areas to be painted which are inaccessible to spray application or areas requiring touchup may be painted with brush or daubers. Epoxy intermediate and polyurethane finish paints may be applied by brushes or rollers provided the coating cures to a smooth and uniform finish.

Spray shall be adjusted to produce a uniform coating. ~~All~~ *If using the structural steel paint system in accordance with 619.09(a), all* 90 degree edges shall be striped *on the second and third coats,* and then repainted with the remaining steel surfaces. ~~Painting techniques shall minimize dry overspray. Dry overspray shall be removed prior to application of other coatings and after application of the finish coat.~~ *If specified, the stripe coat shall be allowed to dry to the manufacturer's recommended recoat dry time prior to painting the second and third coats on the remaining steel surfaces.*

~~All paint coatings shall have a dry film thickness not less than 80% of the required dry film thickness.~~

If using the partial paint system in accordance with 619.09(b), all 90 degree edges shall be striped on each of the coats, and then repainted with the remaining steel surfaces. If specified, the stripe coat shall be allowed to dry to the manufacturer's recommended recoat dry time prior to painting the remaining steel surfaces. Painting techniques shall minimize dry overspray. Dry overspray shall be removed prior to application of other coatings and after application of the finish coat.

(f) Curing Time

The minimum curing time between coatings shall be 24 h for inorganic zinc primers and 8 h for the epoxy intermediate coat. The curing time will vary depending on the temperature and humidity. The inorganic zinc primer shall be cured to a minimum solvent resistance rating of 4 in accordance with ASTM D 4752 prior to the application of the epoxy intermediate coat. It shall be demonstrated that the inorganic zinc primer is in accordance with this requirement. The epoxy intermediate coat shall be cured in accordance with the manufacturer's recommendations prior to the application of the

polyurethane finish coat. The polyurethane finish coat shall be applied within 12 calendar days of application of the epoxy intermediate coat.

The curing time of all other paint systems or coatings shall be in accordance with the manufacturer's recommendations.

(g) Stencil Identification

After the finish coat has been approved, project identification information shall be painted with a stencil in 2 in. (50 mm) black capital letters onto the outside of both facia beams, at the right end of the beam and near the end bent, which reads as follows:

_____
bridge number

_____
contract number

PAINTED _____
date

619.11 Shop Painting

All structural steel shall be cleaned in accordance with 619.08(c). ~~All technical data sheets containing manufacturer's recommendations and instructions shall be provided in the QCP and in accordance with ITM 803.~~

All structural steel, except for ASTM A 709, grade 50W (ASTM A 709M, grade 345W) steel, shall receive an inorganic zinc primer, including faying surfaces of high strength bolted connections and areas in contact with concrete. When shear connectors have been specified, the top of the *top* flange shall not be painted.

Surfaces, other than the contact surfaces described above, which are inaccessible after erection shall be painted in the shop with the full paint system required on the completed bridge.

Machine finished surfaces for sliding contact shall be coated with heavy grease as soon as practicable after being accepted, but before removal from the shop.

Erection marks may be painted on zinc painted surfaces. Shop painted beams shall not be loaded for shipment until the paint ~~is dry~~ *has been allowed to dry to the manufacturer's recommended dry to handle time*.

ASTM A 709, grade 50W (ASTM A 709, grade 345W) steel shall be left unpainted, except as shown on the plans. Surfaces, when specified, shall be painted in accordance with 619.09(a), except the finish coat shall be in accordance with 909.02(e).

619.12 Field Painting New Steel Bridge

All structural steel which has been painted with inorganic zinc primer in the shop, except for steel contact surfaces and surfaces to be in contact with concrete, shall be

painted with the other coatings specified for structural steel paint system in accordance with 619.09(a). All steel surfaces which become inaccessible to field painting after final erection shall be painted with all coats of structural steel paint system before structural steel ~~in~~ *is* erected.

If application of the inorganic zinc primer on a steel surface is not permitted in the shop before erection of the bridge, the surfaces which are exposed shall be cleaned in accordance with 619.08(a), 619.08(b), and 619.08(c). These surfaces shall then be painted with the structural steel paint system after erection.

Surface areas where the inorganic zinc primer was damaged during shipping, handling, and erection shall be cleaned in accordance with 619.08(a), 619.08(b), and either 619.08(d) or 619.08(h). Likewise, all bolt and field connections shall be cleaned in the same manner. All the damaged areas, and bolt and field connections shall then be painted with the inorganic zinc primer applied in the shop. This requirement will not apply to temporary steel bridges.

Where steel surfaces have been painted with the full paint system and the paint coatings have been damaged, the affected steel surface areas shall be cleaned in accordance with 619.08(h). Structural steel paint system shall then be re-applied.

619.13 Painting Existing Steel Bridges

The surfaces to be cleaned and painted shall include the surfaces of all steel members of the superstructure, substructure, floor beams, stringers, plates, castings, bearing assemblies, ornamental handrails, lattice work, and other steel appurtenances.

If the contract specifies clean steel bridge, the bridge steel shall be cleaned in accordance with 619.08(a), 619.08(b), and either 619.08(d) or 619.08(h). The structural steel paint system in accordance with 619.09(a) shall be used for painting.

If the contract specifies clean steel bridge, partial, the bridge steel shall be cleaned in accordance with 619.08(a), 619.08(b), and either 619.08(d), or 619.08(g), or 619.08(h). The partial paint system in accordance with 619.09(b) shall be then be used for painting.

619.14 Drain Castings Treatment

Drain castings shall be satisfactorily cleaned. The castings shall not be shot-blasted. If castings are sandblasted, a brush blast technique shall be used in accordance with 619.08(f).

The drain castings shall be painted with a black finish coat in accordance with 909.02(c).

~~**619.15 Claims**~~

~~No claim shall be made for damage, including but not limited to, damage for delay, increased expense, maintenance, start up costs, additional costs due to passage of time arising out of a dispute, or work stoppage relating to whether a surface was adequately cleaned or painted.~~

~~No claim shall be made due to a greater amount of paint used in excess of the minimums required by the contract or for the stoppage of work. Each bridge shall be inspected before bidding for the exact type of primer that exists on each bridge.~~

619.~~16~~ *15* Responsibility for Damage

Unless otherwise permitted by the Engineer in writing, full containment shall be provided when performing the surface preparation operation and when applying all coats of paint (except primer coats) with spray equipment. All persons and property shall be protected from damage or injury from the surface preparation operations~~, paint,~~ and painting operations *by providing containment as described in the QCP*. Persons and property shall include, but not be limited to, pedestrians, vehicles, and other traffic upon or underneath a bridge, all portions of the bridge superstructure and substructure, and all adjacent property. The Contractor shall be responsible for damages in accordance with 107.17.

619.16 Bridge Types

For the purposes of this specification, bridges will be identified by one of the following types.

(a) Type 1 – The steel to be cleaned and painted is entirely beneath the bridge deck. A beam or girder bridge is a representative bridge.

(b) Type 2 – The majority of the steel to be cleaned and painted is beneath the bridge deck. However some steel extends above, but not over, the bridge deck. A pony truss bridge is a representative bridge.

(c) Type 3 – The majority of steel to be cleaned and painted is above and over the bridge deck. There is some steel to be painted beneath the bridge deck. A through truss is a representative bridge.

619.17 Method of Measurement

Cleaning and painting will be measured by the square foot (square meter) of surface area for each bridge deck of each type as specified. The length of the structure will be the out-to-out length measured longitudinally along the centerline of the structure. The width of the structure will be the out-to-out width measured on a line perpendicular to the centerline of the structure.

~~Cleaning,~~ *Cleaning drain castings and caulking joints of lapping members* ~~and painting~~ will not be measured *for payment*.

If a bridge is advertised as having existing hazardous materials, no measurement will be made of the area covered by mill scale. For bridges advertised as having existing non-hazardous materials, the area of structural steel covered by mill scale will be measured for payment after a proper cleaning of the entire containment area or an agreed large portion there of and removing all other existing materials, including all paint and rust. The percentage of the area of structural steel covered by existing mill scale will be representative of this entire area. The pre-established remedies for this changed condition apply in accordance with 104.02(d) and 619.18.

Floor drain extensions will be measured per each drain extended.

The estimated weight (mass), length, ~~and~~ number of steel spans, *surface area of steel,* and type of primer shown on the plans or in the Proposal book is incidental information. Such information is approximate only. The Department will not guarantee its accuracy.

619.18 Basis of Payment

Removal of paint ~~of~~ *from* an existing bridge will be paid for at the contract ~~lump sum~~ *unit* price *per square foot (square meter) of the surface area of the bridge deck* for clean steel bridge or clean steel bridge, partial, at the bridge number specified. The accepted quantities of existing steel bridges to be painted, or partial painted, whichever is specified, will be paid for at the contract ~~lump sum~~ *unit* price *per square foot (square meter) of the surface area of the bridge deck* for paint steel bridge or paint steel bridge, partial, at the bridge number specified.

(a) Pre-Established Remedies for Changed Conditions

1. Discovery of Hazardous Materials but No Mill Scale on a Site Advertised as Non-Hazardous

The payment will be an additional 25% of the clean steel bridge item as computed in 619.18(b)1 in accordance with 109.05 as payment for all additional costs incurred.

2. Discovery of Mill Scale but No Hazardous Materials on a Site Advertised as Non-Hazardous

If, on a bridge advertised as having existing non-hazardous materials and the presence of hazardous materials has not been confirmed by laboratory analysis, the area of structural steel covered by mill scale comprises greater than 15% of the area of structural steel in accordance with 619.17, additional compensation for the removal of the mill scale will be made as an adjustment to the clean steel bridge item in accordance with the following:

a. For areas of structural steel greater than 15% and up to and including 25% of the area covered by mill scale, an additional payment of 15% of the clean steel bridge item as computed in accordance with 619.18(b)1 will be made.

b. For areas of structural steel greater than 25% and up to and including 50% of the area covered by mill scale, an additional payment of 30% of the clean steel bridge item as computed in accordance with 619.18(a)1 will be made.

c. For areas of structural steel greater than 50% and up to and including 75% of the area covered by mill scale, an additional payment of 45% of the clean steel bridge item as computed in accordance with 619.18(b)1 will be made.

d. For areas of structural steel greater than 75% of the area covered by mill scale, an additional payment of 60% of the clean steel bridge item as computed in accordance with 619.18(b)1 will be made.

3. Discovery of Hazardous Materials and Mill Scale on a Site Advertised as Non-Hazardous

If the laboratory analysis of a waste residue sample on a bridge advertised as having non-hazardous materials yields results indicating the presence of hazardous materials, the entire bridge shall be considered as having mill scale and the following pre-established remedy for this changed condition in accordance with 104.02(d) shall apply. If agreed to in writing between the Contractor and the Department, the work shall proceed with the Contractor assuming all risks for removal of mill scale. An additional 55% of the clean steel bridge item as computed in 619.18(b)1 in accordance with 109.05 will be paid as additional compensation for the removal and disposal of the hazardous materials, the removal of the mill scale, the additional containment required, and all other incidental items associated with the removal of the hazardous materials and mill scale.

(b) Prices used in Pre-Established Remedies to Changed Conditions

The following prices will be computed and used as the price for the pay item identified below in all pre-established remedies to changed conditions referenced in this section.

1. The price for the clean steel bridge item, per bridge, used in all pre-established remedies to changed conditions referenced in this section will be limited to the lesser of the following:

a. 70% of the sum of the clean steel bridge item and paint steel bridge item for that bridge; or

b. the actual amount for the clean steel bridge item for that bridge shown in the Schedule of Pay Items.

Drain extensions will be paid for at the contract unit price per each.

~~If the contract includes a pay item for maintaining traffic, such work will be paid for at the contract lump sum price for maintaining traffic, at the bridge number specified.~~

~~Environmental control devices required when cleaning and painting existing steel bridges will be paid for at the contract lump sum price for environmental control at the bridge number specified.~~

Payment will be made under:

Pay Item	**Pay Unit Symbol**
Clean Steel Bridge, *Type* ____, *QP-* ____, *Str. No.* ___, ~~Br. No. ____~~	~~LS~~ *SFT (m2)*
Clean Steel Bridge, Partial, *Type* ____, *QP-* ____, *Str. No.* ____, ~~Br. No. ____~~	~~LS~~ *SFT (m2)*
Drain Extension	EACH
~~Environmental Control, Br. No. _____~~	~~LS~~
~~Maintaining Traffic, Br. No. _____~~	~~LS~~
Paint Steel Bridge, *Type* ____, *Str. No.*____, ~~Br. No. _____~~	~~LS~~ *SFT (m2)*
Paint Steel Bridge, *Partial, Type* ____, *Str. No.*____, ~~Br. No. ___~~	~~LS~~ *SFT (m2)*

The cost to prepare a QCP shall be included in the cost of ~~other~~ *the* pay items *of this section*. The cost of providing the Department with access to the bridge~~, the use of special cleaning methods, handling debris containers,~~ *and* seasonal or weather limitations~~, and~~ *shall be included in the cost of the pay items of this section.* ~~labor, materials, and equipment required for maintaining traffic shall be included in the cost of other pay items.~~

If a bridge is advertised as having existing hazardous materials, no additional payment will be made for the removal of mill scale. The cost of the removal of mill scale shall be included in the cost of clean steel bridge or clean steel bridge, partial.

If a bridge is advertised as having existing non-hazardous materials and the percentage of the area covered by mill scale is less than or equal to 15% of the total structural steel surface area of a bridge measured in accordance with 619.17 no additional payment will be made for the removal of mill scale. The cost of the removal of mill scale shall be included in the cost of clean steel bridge or clean steel bridge, partial.

The cost of furnishing all materials, equipment, and labor required for washing, solvent cleaning, scraping, steel brushing, or other acceptable methods for removing paint in the locations directed shall be included in the cost of clean steel bridge or clean steel bridge, partial. *The cost of cleaning drain castings shall be included in the cost of clean steel bridge or clean steel bridge, partial.*

The cost of providing containment in accordance with 619.15 shall be included in the cost of the pay items of this section.

The cost of furnishing all materials *including caulk*, equipment, and labor to perform *caulking and* painting with structural steel *or partial* paint system shall be included in the cost of paint steel bridge ~~and to perform *caulking and* painting with partial paint system shall be included in the cost of~~ *or* paint steel bridge, partial. ~~Painting will not be paid for separately, unless so specified. The cost thereof shall be included in the cost of other pay items.~~ *The cost of furnishing all materials, equipment, and labor to perform painting of the drain castings shall be included in the cost of paint steel bridge or paint steel bridge, partial.*

The cost of all equipment, material, labor, testing, *use of special cleaning methods, shipping of waste residue samples, handling* and disposal of spent materials, *waste residues, waste residue containers* and *all other* debris *associated with environmental control and cleaning* shall be included in the cost of ~~environmental control~~ *the clean steel bridge or clean steel bridge, partial pay item*. ~~No additional payment will be made for delays from all operations undertaken for this work. The absence of an environmental control pay item shall not negate the Contractor's responsibility for complying with the environmental control requirements in all phases of this work.~~